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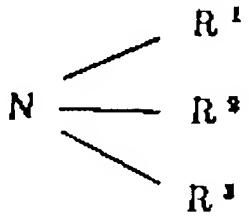
(54) FORMATION OF AMORPHOUS SILICON FILM

(57) Abstract:

PURPOSE: To increase the growing speed of an amorphous silicon (a-Si) film without deteriorating the characteristics of the film in the manufacture of an a- Si film by a chemical vapor deposition (CVD) method by adding a specified amount of ammonia (deriv.) to a gaseous starting material.

CONSTITUTION: Ammonia (deriv.) represented by formula I and/or hydrazine (deriv.) represented by formula II is used. In the formulae each of R1WR7 is H, alkyl or aryl. A substrate is placed in a decomposition furnace, silane of higher order represented by formula III (where n is 2) such as disilane or trisilane is introduced into the furnace optionally together with an inert gas such as nitrogen, and the silane is thermally decomposed at about 250W600°C to deposit an a-Si film on the substrate. At this time, said ammonia (deriv.) and/or hydrazine (deriv.) is added to the silane by an amount satisfying relation represented by formula IV [where N is the amount of nitrogen in the ammonia (deriv.) and/or hydrazine (deriv.), and Si is the amount of silicon in the gaseous silane].



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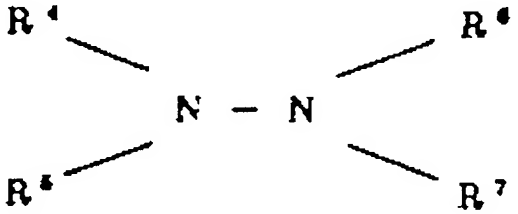

II

Si_nH_{2n+2} III

IV

$0.01 \leq N/Si$（グラム－アトム比）< 0.2